



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,562	12/30/2003	Gregory P. Crawford	59067US002	8039

32692 7590 03/29/2005

3M INNOVATIVE PROPERTIES COMPANY  
PO BOX 33427  
ST. PAUL, MN 55133-3427

EXAMINER

CHEN, WEN YING PATTY

ART UNIT PAPER NUMBER

2871

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 10/748,562	<b>Applicant(s)</b> CRAWFORD ET AL.	
	<b>Examiner</b> Wen-Ying P. Chen	<b>Art Unit</b> 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-53 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

### **DETAILED ACTION**

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-51 and 53, drawn to methods of aligning liquid crystal, classified in class 349, subclass 42.
- II. Claim 52, drawn to an article, classified in class 385.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product, invention II, can be made by a materially different process such as aligning the liquid crystal relative to the alignment material based on the interference pattern, or aligning the liquid crystal relative to the alignment material based on the polarization state of the radiation.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species of the claimed invention:

(1) the specifics of the method of aligning liquid crystal by exposing an alignment material to an interference pattern to cause a chemical reaction in the alignment material wherein the liquid crystal aligns relative to the alignment material based on the interference pattern, which results a first method (claims 1-45);

(2) the specifics of the method of aligning liquid crystal by exposing an alignment material to radiation wherein different portions of the alignment material are simultaneously exposed to different polarization states of the radiation and the liquid crystal aligns relative to the alignment material based on the polarization state of the radiation, which results a second method (claims 46-48);

(3) the specifics of the method of aligning liquid crystal by exposing an alignment material to polarized radiation wherein the polarization state of the radiation varies continuously across a portion of the alignment material and the liquid crystal aligns relative to the alignment material based on the polarization state of the radiation, which results a third method (claim 49);

(4) the specifics of the method of aligning liquid crystal by exposing a curved surface comprising an alignment material to polarized radiation wherein the liquid crystal aligns substantially parallel to an alignment direction related to the polarized radiation, which results a fourth method (claims 50-51);

(5) the specifics of the method of aligning liquid crystal by overlapping at least three beams originating from the same source to form an interference pattern wherein the liquid crystal aligns relative to the alignment material based on the interference pattern, which results a fifth method (claim 53).

Art Unit: 2871

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

If specie (1) is elected, the applicant is required to further elect from the sub-species grouped as follows:

- a) the specifics of the method of alignment wherein the chemical reaction causes:
  - i. polymerization in the alignment material
  - or
  - ii. depolymerization in the alignment material
- b) the specifics of the method of alignment wherein the surface is:
  - i. substantially planar
  - or
  - ii. curved
- c) the specifics of the method of alignment wherein the liquid crystal aligns:
  - i. substantially homeotropically where the alignment material is exposed to regions of high intensity
  - or
  - ii. substantially homeotropically where the alignment material is exposed to regions of low intensity
  - or
  - iii. substantially homogeneously where the alignment material is exposed to regions of high intensity
  - or
  - iv. substantially homogeneously where the alignment material is exposed to regions of low intensity
- d) the specifics of the method of alignment wherein the interference pattern comprises regions of:
  - i. different linear polarization
  - or
  - ii. linear polarization
- e) the specifics of the method of alignment wherein at least a portion of the liquid crystal aligns:
  - i. substantially homeotropically relative to a surface of the alignment material
  - or
  - ii. obliquely relative to a surface of the alignment material

Art Unit: 2871

- or
  - iii. substantially homogeneously relative to a surface of the alignment material
- f) the specifics of the method of alignment wherein two of the beams have:
  - i. similar polarization
  - or
  - ii. different polarization
- g) the specifics of the method of alignment wherein the liquid crystal is disposed on the surface:
  - i. prior to exposure to the interference pattern
  - or
  - ii. after exposure to the interference pattern

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Art Unit: 2871

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Ying P. Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Ying P Chen  
Examiner  
Art Unit 2871

wpc

  
ROBERT KIM  
SUPERVISOR  
TECHNOLOGY CENTER 2800